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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/688,168

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Yuk F. Chan

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EXAMINER

NGUYEN, PHU HOANG

ART UNIT

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1791

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/688,168	CHAN ET AL.	
	Examiner	Art Unit	
	Phu H. Nguyen	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 October 2007.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5-16,28-34,37 and 38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-16,28-34,37 and 38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Acknowledgement is made of Amendment received 10/12/2007. Claims 1, 2, 5-7, 31, 34 and 37 are amended, claims 3-4, 17-27 and 35-36 are cancelled, and new claim 38 is offered for consideration.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 5-11, 13-15 and 28-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xun (U.S Patent No. 6287510) in view of Lundsager (U.S Patent No. 4900698) and further in view of Gheorghiu et al. (U.S Patent No. 5263263).

Regarding claims 1-2, 5 and 28-30, Xun discloses a method for forming a cellular monolith bodies such as honeycombs (column 9, line 26-28) comprising: forming a mixture of powder materials, binder, solvent for the binder, non-solvent then mixing and plasticizing, and shaping to form a green structure. The green structure is dried and fired (column 1, line 63 to column 2, line 4). Xun also discloses examples of the non-solvent are oils (column 5, line 49-51) (corresponding to the claimed "an oil-based component" recited in the instant claim 1) and the preferred binders used are aqueous based (column 4, line 37-38) wherein the aqueous based solvent can be water (corresponding to the claimed "the aqueous solvent is water" recited in the instant claim 28) (column 4, line 21-24). Xun further discloses typical cellulose ether binders are

methylcellulose and/or methylcellulose derivatives (corresponding to the claimed "the binder is a cellulose ether binder" recited in the instant claim 29 and the claimed "the binder comprises methylcellulose or a methylcellulose derivative" recited in the instant claim 30) (column 4, line 49-64). Furthermore, Xun discloses the firing conditions where oils and cellulose ether binders are removed in the slow heating of the temperature region of about 100-500 degree C of the firing cycle (column 9, line 46-48); especially the lower temperature (<200 degree C) is the evaporation phase which is the major way for the organics to escape (column 10, line 4-6). Then structures are heated to temperature greater than about 500 degree C. Xun did not expressly disclose the removing of a portion of the oil based component from the green honeycomb article by flowing a heated gas longitudinally through the green honeycomb article in the heating cycle. Lundsager discloses oil is removed by heating in a forced air oven at 100 degree C and removal by heating and removal by extraction give essentially the same results (corresponding to the claimed "by flowing a heated gas" recited in the instant claim 1) (column 5, lines 14-16). Furthermore, Gheorghiu discloses drying of ceramic honeycomb ware by flowing a heated gas longitudinally through the green honeycomb article (column 6, line 57 to column 7, line 12). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to remove oil based component from the green honeycomb article by flowing a heated gas longitudinally through the green honeycomb article since drying with flowing a heated gas more efficient than drying with stagnant heated gas (figure 4 of Gheorghiu).

Gheorghiu teaches the effect of temperature and velocity of heated gas on drying rates (figure 4). Changes in temperature, concentrations or other process conditions of an old process within the broad teach of the prior art does not impart patentability in the absence of unexpected result. *In re Aller*, 220 F.2d 454, 105 USPQ (CCPA 1955).

Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Therefore, it would have been obvious to one of ordinary skill in the art to modify Gheorghiu with a desired velocity of heated gas to achieve the desired drying rate of the oil base component.

Regarding claim 6, Xun discloses paraffinic oils that inherently have a flash point and by definition flash point of a flammable liquid is the lowest temperature at which it can form an ignitable mixture with oxygen in air. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to heats the green ceramic article below the flash point of the oil based component.

Regarding claims 7-11, air is a readily available gas, nitrogen is a very common process gas for its inert property and Xun discloses oils and cellulose ether binders are removed in the slow heating of the temperature region of about 100-500 degree C of the firing cycle (column 9, line 46-48) that overlaps the ranges of claims 7 and 11. Also, changes in temperature, concentrations or other process conditions of an old process within the broad teach of the prior art does not impart patentability in the absence of unexpected result. *In re Aller*, 220 F.2d 454, 105 USPQ (CCPA 1955). Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover

the optimum or workable ranges by routine experimentation. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Regarding claims 13-15, Xun discloses the removal of organics can be characterized by three simultaneous pathways in order of increasing activation energy: evaporation, oxidative degradation, and thermal decomposition (column 9, line 60-64) wherein thermal decomposition becomes so fast that it dominates the process at temperature higher than 300 degree C and slow heating rate is preferred here for efficient heat transfer (column 10, line 31-37). Since all three pathways are activated at temperature just higher than 300 degree C the oils are typically removed from ceramic structures (corresponding to the claimed "at least 95% of the oil-based component is removed" recited in the instant claims 15 and 33) in the temperature region of about 100-500 degree C (column 9, line 46-49). Accordingly, claims 13-15 are rejected.

Regarding claims 31-34, Gheorghiu discloses the green honeycomb article is dried (corresponding to the claimed "at least 95% of the oil based component is removed" recites in the instant claim 33) in about 20 minutes in an example with a temperature of the heated air at 100 degree C and velocity of about 5 m/s. Furthermore, Gheorghiu discloses that at higher flow rate of the heated air, one would expect the drying process to speed up (column 6, lines 37-53 and figure 4). Therefore, one of ordinary skill in the art at the time the invention was made can adjust the flow rate of heated gas in drying process of the ceramic article as taught by Gheorghiu.

Regarding claim 37, in addition to the discussion as applied to claims 1-2, 5 and 28-30 above, Gheorghiu further discloses the green honeycomb article (W, fig. 2) is

positioned on a support device such that the longitudinal cells are arranged vertically (axis A, fig. 2) and heated gas is forced out of duct (26, fig. 2) vertically through the longitudinal cells of the green ceramic article (column 3, line 33 to column 4, line 6). Accordingly, claim 37 is rejected.

Regarding claim 38, in addition to the discussion as applied to claims 1-2, 5 and 28-30 above, Lundsager discloses in a preferred embodiment the mineral oil is removed by heating in a forced air oven at 100 degree C. Then a preferred embodiment for firing step is to fire slowly from room temperature to then final temperature of 1450 degree C (column 5, lines 14-24). Therefore, it is inherent that the green honeycomb article is cooled down from 100 degree C to room temperature prior to firing. Accordingly, claim 38 is rejected.

Claims 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Xun (U.S Patent No. 6287510), Lundsager (U.S Patent No. 4900698) and Gheorghiu et al. (U.S Patent No. 5263263) as applied to claims 1 above, further in view of Weich Jr. (U.S Patent No. 4717340). Wiech Jr. discloses recirculation of heated gas after condensation step in the Abstract. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to recirculate the gas to increase process efficiency.

Claims 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Xun (U.S Patent No. 6287510), Lundsager (U.S Patent No. 4900698) and Gheorghiu et al. (U.S Patent No. 5263263) as applied to claims 1 above, further in view of Nakajima et al. (U.S Patent No. 4731208). Nakajima discloses recycling the binder materials and

fluid to increase process efficiency. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to recycle a portion of oil based component to increase process efficiency.

Response to Arguments

Applicant's arguments filed 10/12/2007 have been fully considered but they are not persuasive.

In response to applicant's argument that Gheorgiu et al. (U.S Patent No. 5263263) is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Gheorgiu teaches drying a green honeycomb article wherein one would expect the drying process to speed up at a higher flow rate of the heated air (column 6, lines 37-53 and figure 4). Therefore, Gheorgiu is pertinent to the problem of drying a green honeycomb article with which the applicant was concerned.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant also argues that Gheorgiu does not teach or suggest flow rates at all. However, Gheorgiu discloses that it is preferred to utilize an air flow at a temperature about 100 degree +/- 20 degree C; further air velocities (corresponding to "flow rates") between about 2 m/s to 5 m/s have been successfully utilized (column 5, lines 43-48). Therefore, Gheorgiu does suggest a range of flow rates of the heated gas.

Furthermore, the applicant argues that Gheorgiu describes the effect of temperature and velocity of heated gas on water drying rates but does not teach or suggest the effect of temperature and velocity of heated gas on oil removal rates. However, applicant has not provided unexpected result that differentiates the present invention such as the drying rates of oil decreases with the increase in flow rate of heated gas. Therefore, the teaching of Gheorgiu that is increasing flow rate of heated gas would result in a faster drying rate can apply to drying out a component with/without a flash point.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phu H. Nguyen whose telephone number is 571-272-5931. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

P.N 1/3/2008


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